What is claimed is:

1. A bonding structure for a cemented carbide element and a diamond element comprising:

a cemented carbide element formed by a cemented carbide;

a diamond element formed by a diamond; and

a bonding layer that is formed between the cemented carbide element and the diamond element in order to bond them;

wherein said bonding layer includes a diffusion layer in which at least one or two or more metals selected from a group consisting of Fe, Ni, Co, Ti, Zr, W, V, Nb, Ta, Cr, Mo, and Hf diffuses into at least one of said cemented carbide or said diamond.

2. A bonding structure for a cemented carbide element and a diamond element according to claim 1, wherein said bonding layer includes a diffusion layer in which at least one of Fe and Ni diffuses into said diamond.

3. A bonding structure for a cemented carbide element and a diamond element according to claim 1, wherein said bonding layer includes a diffusion layer in which Co diffuses into said diamond, and a Co layer.

4. A bonding structure for a cemented carbide element and a diamond element according to claim 1, wherein said bonding layer includes a diffusion layer in which one or two or more metals selected from a group consisting of Ti, Zr, W, V, Nb, Ta, Cr, Mo, and Hf diffuses into at least one of said cemented carbide or said diamond.

5. A bonding structure for a cemented carbide element and a diamond element according to claim 1, wherein said diamond is a high heat resistant sintered diamond including a binder phase of 0.1 to 15% by volume, where said binder phase is formed by one or two or more selected from the group consisting of carbonates of Mg, Ca, Sr, and Ba, oxides of Mg, Ca, Sr, and Ba, complex carbonates and complex oxide containing two or more thereof.

6. A bonding structure for a cemented carbide element and a diamond element according to claim 1 wherein:

when the cross-section in the transverse direction of said bonding layer is line analyzed using EPMA, the maximum value of the content of said metals in said cross-section is 20 times or greater than an average value of the content of said metal in the region of the cemented carbide element not influenced by the diffusion, and 100 times or greater than the average value of the content of said metal in the region of said diamond element not influenced by the diffusion.

7. A bonding method for a cemented carbide element and a diamond element, comprising the steps of:

interposing a metal material including one or two or more metals selected from a group consisting of Fe, Ni, Co, Ti, Zr, W, V, Nb, Ta, Cr, Mo, and Hf between the cemented carbide element and the diamond element; and

heating said cemented carbide element, said diamond element, and said metal material, forming a diffusion layer in which said metal diffuses into at least one of said cemented carbide element or said diamond element, and bonding said cemented carbide element and said diamond element.

8. A bonding method for a cemented carbide element and a diamond element according to claim 7, wherein said metal material includes at a total of 70% by mass, at least one of Fe and Ni, and in the step for bonding said cemented carbide element and said diamond element, said heating is carried out under conditions A (K) and B (GPa) that satisfy the following two equations simultaneously, and a diffusion layer is formed by at least one of Fe and Ni diffusing into the diamond:

$A > 1175$

$B > 0.0027 \times A + 0.81$

9. A bonding method for a cemented carbide element and a diamond element according to claim 7, wherein said metal material includes Co at 70% by mass or greater, and in the step of bonding said cemented carbide element and said diamond element, said heating is carried out under conditions A (K) and B (GPa) that satisfy the following two equations

simultaneously, a diffusion layer is formed by Co diffusing into said cemented carbide, and a Co layer is formed.

$A > 1175$

$B > 0.0027 \times A + 0.81$

10. A bonding method for a cemented carbide element and a diamond element according to claim 7, wherein said metal material includes at 70% by mass or greater one or two or more of the metals selected from the group consisting of Ti, Zr, W, V, Nb, Ta, Cr, Mo, or Hf, and in the step of bonding said cemented carbide element and said diamond element, said heating is carried out under conditions A (K) and B (GPa) that satisfy the following two equations simultaneously, and a diffusion layer is formed by said metal diffusing into at least one of said cemented carbide or said diamond.

$A > 1175$

$B > 0.0027 \times A + 0.81$

11. A bonding method for a cemented carbide element and a diamond element according to claim 7, wherein said diamond is a high heat resistant sintered diamond including a binder phase of 0.1 to 15% by volume, where said binder phase is formed by one or two or more selected from the group consisting of carbonates of Mg, Ca, Sr, and Ba, oxides of Mg, Ca, Sr, and Ba, complex carbonates and complex oxide containing two or more thereof.

12. A bonding method for a cemented carbide element and a diamond element according to claim 7, wherein said metal material has a first layer and a third layer that include Ni at 70% by mass or greater and a second layer interposed between said first layer and said third layer; and said second layer includes at 70% by mass or greater graphite and/or diamond; and in the step of bonding said cemented carbide element and said diamond element, said heating is carried out under conditions A (K) and B (GPa) that satisfy the following two equations simultaneously, and a diffusion layer is formed by the Ni diffusing into the diamond of said diamond element.

$A > 1175$

$B > 0.0027 \times A + 0.81$

13. A bonding method for a cemented carbide element and a diamond element according to claim 7, wherein said metal material includes as a whole Ni at 55 to 80% by mass and carbon in total at 20 to 45% by mass.

14. A cutting tip for a drilling tool, comprising:

a cemented carbide cutting base mounted on a post of the tool body of the drilling tool;

a diamond element supported by said cutting base; and

a bonding layer formed between said cutting base and said diamond element in order to bond them;

wherein said bonding layer includes a diffusion layer in which one or two or more metals selected from a group consisting of Fe, Ni, Co, Ti, Zr, W, V, Nb, Ta, Cr, Mo, and Hf diffuses onto at least one of said cemented carbide or said diamond.

15. A cutting tip according to claim 14, wherein said bonding layer includes a diffusion layer in which at least one of Fe and Ni diffuse into said diamond.

16. A cutting tip according to claim 14, wherein said bonding layer includes a diffusion layer in which Co diffuses into said diamond, and a Co layer.

17. A cutting tip according to claim 14, wherein said bonding layer includes a diffusion layer in which one or two or more metals selected from a group consisting of Ti, Zr, W, V, Nb, Ta, Cr, Mo, or Hf diffuses onto at least one of said cemented carbide or said diamond.

18. A cutting tip according to claim 14, wherein said diamond element is a high heat resistant sintered diamond including a binder phase of 0.1 to 15% by volume, where said binder phase is formed by one or two or more selected from the group consisting of carbonates of Mg, Ca, Sr, and Ba, oxides of Mg, Ca, Sr, and Ba, complex carbonates and complex oxide containing two or more thereof.

19. A cutting element for a drilling tool, comprising:

a cemented carbide post mounted on the tool body of the drilling tool;

a diamond element supported by said post; and

a bonding layer formed between said post and said diamond element in order to bond them;

wherein said bonding layer includes a diffusion layer in which one or two or more metals selected from a group consisting of Fe, Ni, Co, Ti, Zr, W, V, Nb, Ta, Cr, Mo, and Hf diffuses onto at least one of said cemented carbide or said diamond.

20. A cutting element for a drilling tool, comprising:

a cemented carbide post mounted on the tool body of the drilling tool; and

any of the cutting tips recited in claims 14 to 18; and wherein:

said cutting base of said cutting tip is mounted on said post.

21. A cutting tip for a drilling tool, comprising:

a cutting base mounted on the post of the tool body of the drilling tool;

a diamond element supported by said cutting base; and

a bonding layer formed between said cutting base and said diamond element in order to bond them;

wherein said diamond element is a high heat resistant sintered diamond including a binder phase of 0.1 to 15% by volume, where said binder phase is formed by one or two or more selected from the group consisting of carbonates of Mg, Ca, Sr, and Ba, oxides of Mg, Ca, Sr, and Ba, complex carbonates and complex oxide containing two or more thereof;

said cutting base is formed by a tungsten carbide cemented carbide including Co as a binding agent; and

said diffusion layer includes at least one of Ni or Fe.

22. A cutting tip according to claim 14 or claim 21, wherein an installation site is formed on said cutting base, and has a pair of support surfaces facing towards the leading edge in the drilling direction with a space opened therebetween, and said diamond element has a shape conforming to that of said installation site, and is attached to said installation site.

23. A drilling tool, comprising:

a tool body;

posts provided in plurality on the distal surface of this tool body; and

a cutting tip attached to each of the posts; and wherein:

said cutting tip is any of the cutting tips recited claims 14 through 18 and claim 21

24. A drilling tool, comprising:

a tool body; and

a cutting element provided in plurality on the distal surface of the tool body; and wherein:

said cutting element is the cutting tip recited in claim 19.